

CLAIMS

1. Process for the hydrothermal treatment of asbestos and/or materials containing asbestos in supercritical water (Supercritical Water, SCW) characterised in that in succession they provide for the following steps:

- 5 - withdrawal (3) of water from a tank (2);
- transformation (5) of the water in supercritical water;
- reaction of the supercritical water with asbestos and/or with the material containing asbestos in a suitable environment (8) by means of a hydrolysis process;
- 10 - cooling (14) of the waste water;
- filtering (15) of the waste water;
- collection of the waste water in a tank (17).

2. Process according to claim 1, characterised in that said water is distilled.

15 3. Process according to claim 1, characterised in that said water is oxygenate.

4. Process according to claim 1, characterised in that it is produced in a confined environment.

20 5. Process according to claim 1, characterised in that it is carried out in continuous modality.

6. Process according to claim 1, characterised in that it is carried out in discontinuous modality.

25 7. Process according to claim 1, characterised in that it is carried out in semi-batch modality, that is with water in continuous modality and solid material in discontinuous modality.

8. Process according to claim 1, characterised in that it is carried out in the following conditions of temperature T, pressure P and hydrolysis time:

- $400^{\circ}\text{C} < T < 750^{\circ}\text{C}$;
- $22.11 \text{ MPa} < P < 28 \text{ MPa}$;
- 30 • hydrolysis time < 24 hours.

9. Process according to claim 1, characterised in that, before the reaction with the supercritical water, the asbestos and/or the material containing asbestos is submitted to a wet pretreatment.

5 10. Process according to claim 9, characterised in that said wet pretreatment provides for the breaking up and grinding of the asbestos and/or of the material containing asbestos in the presence of water.

11. Process according to claim 9, characterised in that said pretreatment comes about with additives.

10 12. Plant for the treatment of asbestos and/or materials containing asbestos characterised in that it comprises a water tank (2), a withdrawal pump (3) associated to said tank (2), a furnace (4) containing a serpentine coil (5) fed by said withdrawal pump (3) for the transformation of the water in supercritical water and a reactor (8) for the reaction of the supercritical water with asbestos and/or with the material containing asbestos, heat
15 exchange means (14) for cooling the waste water of said reactor (8), and means for filtering (15) the water positioned at the output of said exchange means (14) collection means (17) of the cooled and filtered waste water.

13. Plant according to claim 12, characterised in that said water is distilled.

20 14. Plant according to claim 12, characterised in that said water is oxygenated.

15. Plant according to claim 12, characterised in that it is in a confined environment.

25 16. Plant according to claim 12, characterised in that the reactor (8) is made to function with the following values of temperature T, of pressure P and hydrolysis time:

- $400^{\circ}\text{C} < T < 750^{\circ}\text{C}$;
- $22.11 \text{ MPa} < P < 28 \text{ MPa}$;
- hydrolysis time < 24 hours.

30 17. Plant according to claim 12, characterised in that the furnace (4) is

electric.

18. Plant according to claim 12, characterised in that said furnace (4) is a fluidised bed.

5 19. Plant according to claim 12, characterised in that said reactor (8) is a water storage tank.

20. Plant according to claim 12, characterised in that said reactor (8) can be extracted from the furnace (4).

21. Plant according to claim 12, characterised in that said exchangers (14) have a serpentine coil.

10 22. Plant according to claim 12, characterised in that it comprises an adjustment valve (16) inserted downstream from said heat exchange means (14).